CLAIMS

1. A control system for a vehicle, comprising:

at least one input device which is operatively connected to a first sensor, a second sensor and a third sensor for sensing an input to said input device and providing in response thereto a first unprocessed sensor signal, a second unprocessed sensor signal and a third unprocessed sensor signal;

an input device module which is adapted to receive the first unprocessed sensor signal, the second unprocessed sensor signal and the third unprocessed sensor signal and provide a processed sensor signal output;

a first controller which is adapted to receive the first unprocessed sensor signal and the processed sensor signal;

a second controller which is adapted to receive the second unprocessed sensor signal and the processed sensor signal;

a third controller which is adapted to receive the third unprocessed sensor signal and the processed sensor signal, and

a controller bus which is operatively connected to each of said first controller, said second controller and said third controller and adapted to provide signal communication between each of them.

2. The control system of claim 1, wherein each of said first controller, second controller and third controller is adapted to compare the processed sensor signal and the unprocessed sensor signal which it has received to determine a first signal differential, a second signal differential and a third signal differential, respectively.

3. The control system of claim 2, wherein each of said first controller, second controller and third controller is adapted to compare the respective first signal differential, second signal differential and third signal

differential to a predetermined differential threshold, and wherein if the absolute value of either of the first signal differential, second signal differential and third signal differential is greater than the predetermined differential threshold, said first controller, second controller and third controller are adapted to determine a resolved sensor signal for use by each of them using the unprocessed sensor signals and the processed sensor signals, and wherein if the absolute value of the first signal differential, second signal differential and third signal differential is less than or equal to the predetermined differential threshold, each of said first controller, second controller and third controller is adapted to use the processed sensor signal.

4. The control system of claim 3, wherein said first controller, second controller and third controller are adapted to determine a resolved sensor signal using a voting process therebetween.

5. The control system of claim 3, wherein said input device is an accelerator actuator and the first sensor, second sensor and third sensor are each an accelerator actuator sensor.

6. The control system of claim 3, wherein said input device is a brake actuator and the first sensor, second sensor and third sensor are each a brake actuator sensor.

7. The control system of claim 3, wherein said input device is a steering actuator and the first sensor, second sensor and third sensor are each a steering actuator sensor.

8. The control system of claim 1, wherein said input device module is also adapted to provide a sensor status signal output, and wherein each of said first controller, second controller and third controller is adapted to receive the sensor status signal.

9.The control system of claim 8, wherein each of said first controller, second controller and third controller is adapted to compare the processed sensor signal and the unprocessed sensor signal which it has received to determine a first signal differential, a second signal differential and a third signal differential, respectively.

10. The control system of claim 9, wherein each of said first controller, second controller and third controller is adapted to compare the respective first signal differential, second signal differential and third signal differential to a predetermined differential threshold, and wherein if the absolute value of either of the first signal differential, second signal differential and third signal differential is greater than the predetermined differential threshold, said first controller, second controller and third controller are adapted to determine a resolved sensor signal value for use by each of them using the unprocessed sensor signals, the processed sensor signal and the sensor status signal, and wherein if the absolute value of the first signal differential, the second signal differential and the third signal differential is less than or equal to the predetermined differential threshold, each of said first controller, said second controller and said third controller is adapted to use the processed sensor signal.

11. A control system for a vehicle, comprising:

a plurality of input devices, each said input device operatively connected to a first sensor, a second sensor and a third sensor for sensing an input to said input device and providing in response thereto a first unprocessed sensor signal, a second unprocessed sensor signal and a third unprocessed sensor signal;

a plurality of input device modules, each said input device module corresponding to one of the plurality of input devices and adapted to receive its first unprocessed sensor signal, second unprocessed

sensor signal and third unprocessed sensor signal and provide a corresponding processed sensor signal output;

a first controller which is adapted to receive the first unprocessed sensor signal and the processed sensor signal of each of said input devices;

a second controller which is adapted to receive the second unprocessed sensor signal and the processed sensor signal of each of said input devices;

a third controller which is adapted to receive the third unprocessed sensor signal and the processed sensor signal of each of said input devices; and

a controller bus which is operatively connected to each of said first controller, said second controller and said third controller and adapted to provide signal communication between each of them.

12. The control system of claim 11, wherein each of said first controller, said second controller and said third controller is adapted to compare the processed sensor signal and the unprocessed sensor signal which it has received from each input device to determine a first signal differential, a second signal differential and a third signal differential, respectively, for each said input device.

13. The control system of claim 12, wherein each of said first controller, second controller and third controller is adapted to compare the respective first signal differential, second signal differential and third signal differential of each input device to a predetermined differential threshold of that input device, and wherein if the absolute value of the first signal differential, second signal differential and third signal differential of an input device is greater than the predetermined differential threshold of that input device, said first controller, second controller and third controller are adapted to determine a resolved sensor signal value for that input device for use by each of them using the unprocessed sensor signals and the processed sensor signals, and wherein if the absolute value of the first signal differential, second

signal differential and third signal differential of an input device is less than or equal to the predetermined differential threshold of that device, each of said first controller, second controller and third controller is adapted to use the processed sensor signal of that input device.

14. The control system of claim 13, wherein said plurality of input devices is selected from a group consisting of an accelerator actuator, a brake actuator, a steering actuator, a yaw rate sensor module and a lateral acceleration sensor module.

15. The control system of claim 13, wherein said first controller, second controller and third controller are adapted to determine a resolved sensor signal using a voting process therebetween.

16. The control system of claim 11, wherein each of said input device modules is also adapted to provide a respective sensor status signal output, and wherein each of said first controller, second controller and third controller are adapted to receive the respective sensor status signals.

17. The control system of claim 16, wherein each of said first controller, second controller and third controller is adapted to compare the processed sensor signal and the unprocessed sensor signal which it has received from each input device to determine a first signal differential, a second signal differential and a third signal differential, respectively, for each input device.

18. The control system of claim 17, wherein each of said first controller, said second controller and said third controller is adapted to compare the respective first signal differential, second signal differential and third signal differential of each input device to a predetermined differential threshold of that input device, and wherein if the absolute value of the first

signal differential, the second signal differential and the third signal differential of an input device is greater than the predetermined differential threshold of that input device, said first controller, second controller and third controller are adapted to determine a resolved sensor signal value for that input device for use by each of them using the unprocessed sensor signals, the processed sensor signals and the sensor status signals, and wherein if the absolute value of either of the first signal differential, second signal differential and third signal differential of an input device is less than or equal to the predetermined differential threshold of that device, each of said first controller, second controller and third controller is adapted to use the processed sensor signal of that input device.

19. A method of determining an input command for a control system from a sensed input:

providing a first unprocessed sensor signal and a processed sensor signal which are associated with a sensed input to a first controller and comparing the first unprocessed sensor signal and the processed sensor signal to obtain a first signal differential;

providing a second unprocessed sensor signal and the processed sensor signal which are associated with the sensed input to a second controller and comparing the second unprocessed sensor signal and the processed sensor signal to obtain a second signal differential;

providing a third unprocessed sensor signal and a processed sensor signal which are associated with the sensed input to a third controller and comparing the third unprocessed sensor signal and the processed sensor signal to obtain a third signal differential;

comparing the absolute value of each of the first signal differential, second signal differential and third signal differential to a predetermined differential threshold,

if the absolute value of each of the first signal differential, second signal differential and third signal differential is less than or equal to the

predetermined differential threshold, using the processed sensor signal in each of the first controller, second controller and third controller for control based on the sensed input;

if the absolute value of one of the first signal differential, second signal differential and third signal differential is greater than the predetermined differential threshold, determining a resolved sensor signal for use in each of the first controller, second controller and third controller for control based on the sensed input.

20. The method of claim 19, wherein determining a resolved signal in each of the first controller, second controller and third controller for control based on the sensed input comprises voting between the first controller, second controller and third controller to determine the resolved sensor signal.

21. The method of claim 20, wherein voting between the first controller, the second controller and the third controller to determine the resolved sensor signal comprises:

determining a first representative signal in the first controller using the first unprocessed sensor signal and the processed sensor signal;

determining a second representative signal in the second controller using the second unprocessed sensor signal and the processed sensor signal;

determining a third representative signal in the third controller using the third unprocessed sensor signal and the processed sensor signal; and

comparing the first representative signal, the second representative signal and the third representative signal to determine the resolved sensor signal.

22. The method of claim 21, wherein comparing the first representative signal, second representative signal and third representative signal to determine the resolved sensor signal comprises:

comparing each of the first representative signal, the second representative signal and third representative signal to one another to determine a first representative differential, a second representative differential and a third representative differential;

comparing each of the first representative differential, second representative differential and third representative differential to a predetermined representative differential threshold,

if the absolute value of each of the first representative differential, second representative differential and third representative differential is less than or equal to the predetermined representative differential threshold, determining a median value of the first representative signal, the second representative signal and third representative signal for use as the resolved sensor signal;

if the absolute value of one of the first representative differential, second representative differential and third representative differential is less than or equal to the predetermined representative differential threshold, determining a mean value of the two representative signals associated with the representative differentials that are less than or equal to the predetermined representative differential threshold; and

if the absolute value of two or more of the first representative differential, second representative differential and third representative differential is greater than the predetermined representative differential threshold, selecting a predetermined fault value for use as the resolved sensor signal.

23. A method of determining an input command for a control system from a sensed input:

providing a first unprocessed sensor signal, a processed sensor signal and a sensor status signal which are associated with a sensed input to a first controller and comparing the first unprocessed sensor signal

and the processed sensor signal to obtain a first signal differential, wherein the sensor status signal is adapted to provide a fault or-no-fault status indication for each of the first unprocessed sensor signal, second unprocessed sensor signal and the third unprocessed sensor signal;

providing a second unprocessed sensor signal, the processed sensor signal and the sensor status signal which are associated with the sensed input to a second controller and comparing the second unprocessed sensor signal and the processed sensor signal to obtain a second signal differential;

providing a third unprocessed sensor signal, the processed sensor signal and the sensor status signal which are associated with the sensed input to a third controller and comparing the third unprocessed sensor signal and the processed sensor signal to obtain a third signal differential;

comparing the absolute value of each of the first signal differential, second signal differential and third signal differential to a predetermined differential threshold,

if the absolute value of each of the first signal differential, second signal differential and third signal differential is less than or equal to the predetermined differential threshold, using the processed sensor signal in each of the first controller, second controller and third controller for control based on the sensed input;

if the absolute value of at least one of the first signal differential, second signal differential and third signal differential is greater than the predetermined differential threshold , determining which of the first signal differential, second signal differential and third signal differential is greater than the predetermined differential threshold and providing a fault indication for the unprocessed sensor signal associated with that signal differential;

comparing the fault indication of the unprocessed sensor signal with the status indication of the sensor status signal of that unprocessed sensor signal;

if the fault indication of the unprocessed sensor signal and the status indication of the sensor status signal of that unprocessed sensor signal both indicate a fault, using the processed sensor signal in each of the first controller, second controller and third controller for control based on the sensed input

if the fault indication of the unprocessed sensor signal with the status indication of the sensor status signal of that unprocessed sensor signal do not both indicate a fault, determining a resolved sensor signal for use in each of the first controller, second controller and third controller for control based on the sensed input.

24. The method of claim 23, wherein determining a resolved signal in each of the first controller, second controller and third controller for control based on the sensed input comprises voting between the first controller, the second controller and the third controller to determine the resolved sensor signal.

25. The method of claim 24, wherein voting between the first controller, second controller and third controller to determine the resolved sensor signal comprises:

determining a first representative signal in the first controller using the first unprocessed sensor signal and the processed sensor signal;

determining a second representative signal in the second controller using the second unprocessed sensor signal and the processed sensor signal;

determining a third representative signal in the third controller using the third unprocessed sensor signal and the processed sensor signal; and

comparing the first representative signal, second representative signal and third representative signal to determine the resolved sensor signal.

26. The method of claim 25, wherein comparing the first representative signal, the second representative signal and the third representative signal to determine the resolved sensor signal comprises:

comparing each of the first representative signal, the second representative signal and third representative signal to one another to determine a first representative differential, a second representative differential and a third representative differential;

comparing each of the first representative differential, second representative differential and third representative differential to a predetermined representative differential threshold,

if the absolute value of each of the first representative differential, second representative differential and third representative differential is less than or equal to the predetermined representative differential threshold, determining a median value of the first representative signal, second representative signal and third representative signal for use as the resolved sensor signal;

if the absolute value of one of the first representative differential, second representative differential and third representative differential is less than or equal to the predetermined representative threshold, determining a mean value of the two representative signals associated with the representative differentials that are less than or equal to the predetermined representative threshold; and

if the absolute value of each of the first representative differential, second representative differential and third representative differential is greater than the predetermined representative differential threshold, selecting a predetermined fault value for use as the resolved sensor signal.

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